

What is claimed is:

1. A polymeric support having a particle size 1 to 300 microns, a surface area from 100 to 1,500 m<sup>2</sup>/g and a pore volume of at least 0.1 cm<sup>3</sup>/g of support for use in association with a catalyst system comprising a co-catalyst in an amount from 0.01 to 0.8 g per g of support said co-catalyst having the formula  $R^1_2AlO(R^1AlO)_mAlR^1_2$  wherein each R<sup>1</sup> is independently selected from the group consisting of C<sub>1-20</sub> hydrocarbyl radicals and m is from 3 to 50 of said support comprising the suspension or emulsion polymerization product of a feedstock comprising:

- (i) from 60 to 99 weight % of one or more C<sub>4-12</sub> vinyl monomers selected from the group consisting of styrene, alpha-methyl styrene, para-methyl styrene and C<sub>1-4</sub> alkyl esters of C<sub>3-6</sub> unsaturated carboxylic acids; and
- (ii) from 40 to 1 weight % of a crosslinking agent selected from the group consisting of divinyl benzene, divinyl toluene, pentaerythritol di- and tri-acrylates and pentaerythritol di- and tri-methacrylates;

and said support being treated with,

- (iii) from 0.01 to 5 mmol per gram of support of a halosulfonic acid;
- (iv) from 0 to 10 mmol per gram of support of a compound of the formula  $M(R^2)_a(OR^2)_b(X)_c$  wherein M is a metal atom selected from the group consisting of Mg, Al and Zn, R<sup>2</sup> is a

C<sub>1-10</sub> alkyl radical and a, b, and c are integers from 0 to 3  
provided the sum of a+b+c = the valence of M; and  
(v) from 0 to 5 mmol per gram of support of a bulky amine.

2. The polymeric support according to claim 1, wherein the vinyl monomer is styrene and is present in an amount from 90 to 98 weight %.
3. The polymeric support according to claim 2, wherein the crosslinking agent is divinyl benzene.
4. The polymeric support according to claim 3, wherein component (iii) is fluorosulfonic acid and is present in an amount from 0.1 to 3 mmol per gram of support.
5. The polymeric support according to claim 4, wherein component (iv) is tri-isobutyl aluminum and is present in an amount from 1 to 3 mmol per gram of support.
6. The polymeric support according to claim 5, wherein component (v) is phenyl dimethyl amine and is present in an amount from 0.1 to 2 mmol per gram of support.
7. The polymeric support according to claim 6, wherein the co-catalyst R<sup>1</sup> is predominantly a C<sub>1-4</sub> alkyl radical and m is from 3 to 30.

8. A catalyst system comprising the support of claim 7, together with a catalyst of the formula:



wherein M is a transition metal; L is a monoanionic ligand independently selected from the group consisting of a cyclopentadienyl-type ligand, a bulky heteroatom ligand and a phosphinimine ligand; X is an activatable ligand; n may be from 1 to 3; and p may be from 1 to 3, provided that the sum of n+p equals the valence state of M, and further provided that two L ligands may be bridged by a silyl radical or a C<sub>1-4</sub> alkyl radical to provide a molar ratio of aluminum from the co-catalyst to transition metal from 20:1 to 300:1.

9. The catalyst system according to claim 8, wherein M is selected from the group consisting of Ti, Zr and Hf.

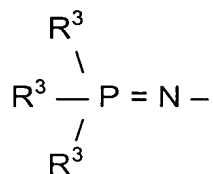
10. The catalyst system according to claim 9, wherein the cyclopentadienyl-type ligand is a C<sub>5-13</sub> ligand containing a 5-membered carbon ring having delocalized bonding within the ring and bound to the metal atom through covalent  $\eta^5$  bonds and said ligand being unsubstituted or up to fully substituted with one or more substituents selected from the group consisting of C<sub>1-10</sub> hydrocarbyl radicals in which hydrocarbyl substituents are unsubstituted or further substituted by one or more substituents selected from the group consisting of a halogen atom and a C<sub>1-4</sub> alkyl radical; a halogen atom; a C<sub>1-8</sub> alkoxy radical; a C<sub>6-10</sub> aryl or aryloxy radical; an amido radical which is unsubstituted or substituted by

up to two C<sub>1-8</sub> alkyl radicals; a phosphido radical which is unsubstituted or substituted by up to two C<sub>1-8</sub> alkyl radicals; silyl radicals of the formula  $-\text{Si}-(\text{R}^5)_3$  wherein each R is independently selected from the group consisting of hydrogen, a C<sub>1-8</sub> alkyl or alkoxy radical, and C<sub>6-10</sub> aryl or aryloxy radicals; and germanyl radicals of the formula  $\text{Ge}-(\text{R}^5)_3$  wherein R<sup>5</sup> is as defined above.

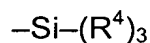
11. The catalyst system according to claim 10, wherein X is selected from the group consisting of a hydrogen atom; a halogen atom, preferably a chlorine or fluorine atom; a C<sub>1-10</sub> hydrocarbyl radical; a C<sub>1-10</sub> alkoxy radical; a C<sub>5-10</sub> aryl oxide radical; each of which said hydrocarbyl, alkoxy, and aryl oxide radicals may be unsubstituted by or further substituted by one or more substituents selected from the group consisting of a halogen atom; a C<sub>1-8</sub> alkyl radical; a C<sub>1-8</sub> alkoxy radical; a C<sub>6-10</sub> aryl or aryloxy radical; an amido radical which is unsubstituted or substituted by up to two C<sub>1-8</sub> alkyl radicals; and a phosphido radical which is unsubstituted or substituted by up to two C<sub>1-8</sub> alkyl radicals.

12. The catalyst system according to claim 11, wherein the bulky heteroatom ligand is selected from the group consisting of ketimide ligands, silicon-containing heteroligands, amido ligands, alkoxy ligands, boron heterocyclic ligands and phosphole ligands.

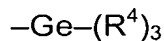
13. The catalyst system according to claim 11, wherein the bulky heteroatom ligand is a phosphinimine ligand of the formula:



wherein each R<sup>3</sup> is independently selected from the group consisting of a hydrogen atom; a halogen atom; C<sub>1-10</sub> hydrocarbyl radicals which are unsubstituted by or further substituted by a halogen atom; C<sub>1-8</sub> alkoxy radicals; C<sub>6-10</sub> aryl or aryloxy radicals; an amido radical; a silyl radical of the formula:



wherein each R<sup>4</sup> is independently selected from the group consisting of hydrogen, C<sub>1-8</sub> alkyl or alkoxy radicals, and C<sub>6-10</sub> aryl or aryloxy radicals; and a germanyl radical of the formula:



wherein R<sup>4</sup> is as defined above.

14. The catalyst system according to claim 13, wherein the phosphinimine ligand each R<sup>3</sup> is independently selected from the group consisting of C<sub>3-6</sub> alkyl radicals.

15. A process for the preparation of ethylene copolymers which comprises contacting ethylene and at least one C<sub>3-8</sub> alpha olefin under polymerization conditions in the presence of the catalyst of claim 12.

16. A process for the preparation of ethylene copolymers which comprises contacting ethylene and at least one C<sub>3-8</sub> alpha olefin under polymerization conditions in the presence of the catalyst of claim 13.

17. A process for the preparation of ethylene copolymers which comprises contacting ethylene and at least one C<sub>3-8</sub> alpha olefin under polymerization conditions in the presence of the catalyst of claim 14.